

Future Autonomous and Automated Systems Testbed

Completed Technology Project (2012 - 2012)



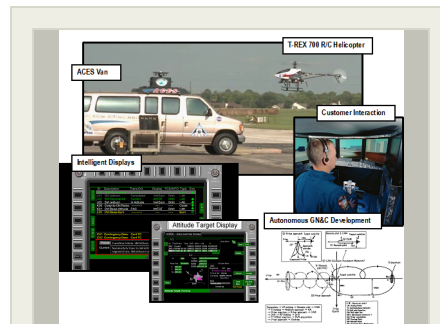
Project Introduction

Trust is the greatest obstacle to implementing greater autonomy and automation (A&A) in the human spaceflight program. The Future Autonomous and Automated Systems Testbed (FAAST) is an R/C helicopter-based system being developed by the Aeroscience and Flight Mechanics Division (EG) as a low-cost, low-risk, hands-on way for customers (program management, crew, and operators) to become familiar with and build trust in A&A systems, and as a platform for engineers to quickly and cheaply test A&A architectures and algorithms. An early goal of this project is the development of an autonomous GN&C system, a key component of which is access to suitable sensor hardware. In this project we requested funds to procure navigation sensors (e.g. MEMS IMU, GPS receiver, LIDAR, etc.) in support of this effort.

It is also envisioned as a platform for building trust in A&A systems among key stakeholders such as program/project management, crew members, and operators. We researched and procured navigation sensors (e.g. MEMS IMU, GPS receiver, LIDAR, etc.) and integrated them into the helicopter platform, with the objective of performance suitable for autonomous waypoint navigation. The intended product of this activity is the development of a prototype navigation system that will form the navigation backbone of FAAST. Upon completion of this project's work, FAAST will have a functioning navigation system suitable for enabling future A&A research objectives, including autonomous rendezvous and docking, and autonomous take-off and landing.

Anticipated Benefits

N/A



Project Image Future
Autonomous and Automated
Systems Testbed

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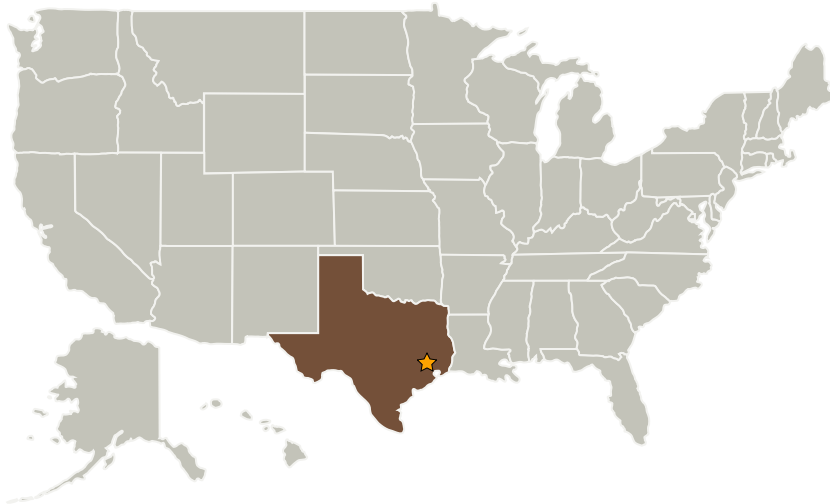
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations

Texas

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Center Innovation Fund: JSC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Carlos H Westhelle

Project Manager:

Angela N Braun

Principal Investigator:

Angela N Braun

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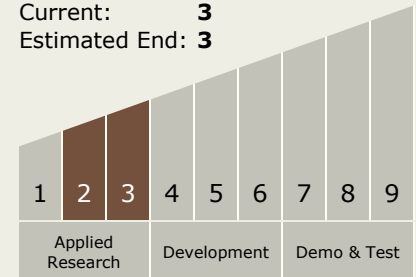
Images

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Project Image Future Autonomous
and Automated Systems Testbed
(<https://techport.nasa.gov/image/2321>)

Technology Maturity
(TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
 - └ TX17.2 Navigation Technologies
 - └ TX17.2.1 Onboard Navigation Algorithms